IN THE CLAIMS:

1. (currently amended) A computed tomographic (CT) imaging system for performing a CT scan, said CT system comprising:

an x-ray source emitting a spectrum of x-rays;

a detector array comprising a plurality of ~~detector cells,~~ detector cells arranged in rows, said detector array including detector cells that are at least one of manufactured from different materials that are sensitive to different portions of the x-ray spectrum or coated with different scintillating materials that are sensitive to a different portion of the x-ray spectrum;

a plurality of alternating discrete filters and air paths in pairs oriented in a Z-direction configured so that individual detector rows receive filtered or unfiltered x-ray beam data;

a gantry for rotating said x-ray source and said detector array;

a table for translating an object between said x-ray source and said detector array; and ~~a patient; and~~

a processor operationally coupled to said detector array, and as an object being imaged and said filter and air path pairs move relative to one another in the Z-direction, said processor configured to:

receive first data regarding a first x-ray spectral range from a first detector cell from a scan with an x-ray source pitch of one detector cell such that the x-ray source advances relative to the table one detector cell per revolution;

receive second data regarding a second x-ray spectral range different from the first x-ray spectral range from a second detector cell different from the first ~~detector cell; and~~ detector cell;

perform a first spectral analysis at a time T_0 using said first data and said second data to determine a location of an analyte in an area of interest in the object being imaged; and

as said relative motion in a Z-direction continues, perform subsequent spectral analyses using different said filter and air path pairs to determine dynamic information of the movement of the analyte.

~~determine spectral information from the first data and the second data.~~

2-4. (cancelled)

5. (currently amended) A CT system in accordance with Claim 1 ~~Claim 4~~ wherein said filters of said plurality of alternating discrete filters and air paths in pairs oriented in a Z-direction ~~x-ray energy filter is positioned~~ are positioned between said x-ray source and ~~an object~~ the object being imaged.

6. (currently amended) A CT system in accordance with Claim 1 ~~Claim 4~~ wherein said filters of said plurality of alternating discrete filters and air paths in pairs oriented in a Z-direction ~~x-ray energy filter is positioned~~ are positioned in an x-ray collimator between said x-ray source and ~~an object~~ the object being imaged.

7-9. (cancelled)

10. (currently amended) A CT system in accordance with ~~Claim 8~~ Claim 1 wherein said discrete ~~filter elements~~ filters each have substantially the same x-ray absorption property.

11. (currently amended) A CT system in accordance with ~~Claim 8~~ Claim 1 wherein one of said discrete ~~filter elements~~ filters has a first x-ray absorption property and one of said discrete ~~filter elements~~ filters has a second x-ray absorption property different from the first.

12. (cancelled)

13. (currently amended) A CT system in accordance with Claim 1 ~~further comprising an x-ray source outputting a single x-ray spectrum~~ wherein said first detector cell detects a different x-ray subspectrum than said second detector cell.

14. (cancelled)

15. (currently amended) A method for determining the presence of an analyte in an object with a computed tomographic (CT) ~~imaging system,~~ imaging system having a detector array comprising a plurality of detector cells arranged in rows, said detector array including detector cells that are at least one of manufactured from different materials that are sensitive to different portions of the x-ray spectrum or coated with different scintillating materials that are sensitive to a different portion of the x-ray spectrum and said imaging system further having a plurality of alternating discrete filters and air paths in pairs oriented in a Z-direction configured so that individual detector rows receive filtered or unfiltered x-ray beam data,

said method comprising:

receiving first data regarding a first x-ray spectral range from a first detector cell from a scan with an x-ray source pitch of one detector cell such that the x-ray source advances one detector cell per revolution;

receiving second data regarding a second x-ray spectral range different from the first x-ray spectral range from a second detector cell different from the first detector cell and the second detector cell at least one of manufactured from a different material sensitive to different portions of the x-ray spectrum from the first detector cell or coated with a different scintillating material sensitive to a different portion of the x-ray spectrum than the first ~~detector cell; and~~ detector cell;

performing a first spectral analysis at a time T_0 using said first data and said second data to determine a location of an analyte in an area of interest in an object being imaged and moved in the Z-direction relative to the filter and air path pairs; and

as relative motion in a Z-direction continues, performing subsequent spectral analyses using different said filter and air path pairs to determine dynamic information of the movement of the analyte.

~~determining spectral information from the first data and the second data.~~

16-28. (cancelled)